

Work Order ID 144957

Thursday, April 28, 2016 7:32:46 AM

144957

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Item ID: D6104-005 Accept ***N9000040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Round Billet, 17-4
 Start Date: 4/28/2016 Start Qty: 20.00 ***20*** Cust Item ID:
 Required Date: 5/12/2016 Req'd Qty: 20.00 ***20*** Customer:

Reference: **DAS**
 Approvals: Process Plan: **13** Date: **APR 28 2016** Tooling: Date: Run Start ***NR1***
 QC: Date: SPC (Y/N): Date: Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D6104	Rev B

100	PURCHASING	0.00				20	APR 28 2016	DAS 13 9-89
100								
Purchasing	Memo	0.00						
Purchasing	Issue P/O: 32189 a)Description: S.S round billet b) Ø4.00" x 5.10" long c) Tolerance on all dimensions are +0.030"/-0.000" d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)e)One blank makes 2 partsf) Material certification required							

110	Receive & Inspect for Damage & Mat'l Certs	0.00						
110								
Packaging	Memo	0.40						
Packaging	Ensure material certification is attached							

120	QC18 In-Coming Inspection Material	0.00				20		DAS 14 9-89
120								
QC	Memo	0.00						
Quality Control	Ensure Material certification comply to Dwg D6104							

16/05/16

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Item ID: D6104-005 Accept ***N900040100*** Setup Start ***NS1***
Revision ID:
Item Name: Round Billet, 17-4 Stop ***NS2***
Start Date: 4/28/2016 Start Qty: 20.00 ***20*** Cust Item ID:
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130 *130* Packaging Packaging	Identify as per dwg & Stock Location: <u>MAT043</u> Memo LOCATION: MAT043	0.00 0.20				<u>20</u>	<u>0</u>		DAS 14 9-09 16/05/06
140 *140* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 2.00							16/5/19 <u>AF</u> M-5 MAY 06 2018

Picklist Print

Thursday, April 28, 2016 7:32:45 AM

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Work Order ID: 144957

144957

Parent Item: D6104-005

D6104-005

Parent Item Name: Round Billet, 17-4

Start Date: 4/28/2016

Required Date: 5/12/2016

Start Qty: 20.00

Required Qty: 20.00

Comments: IPP A: 01.05.08New Issue EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-005P		Purchased	No			110	Each	0.0000	1	20			
D6104-005P 17-4 SS Roundbar 4.00"Od									**				

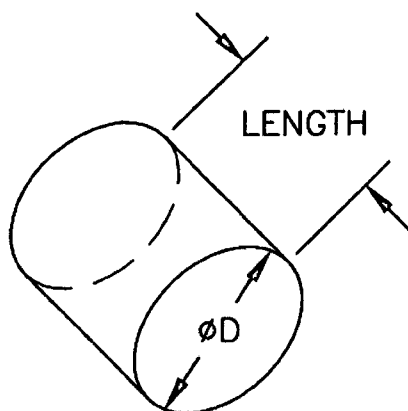


DESIGN RF	DRAWN BY [Signature]	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED [Signature]	APPROVED [Signature]	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 [Signature]

SPECIFICATION CONTROL DRAWING



W/O 144957

DAS
13
9-89

APR 28 2016

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO32189**

Purchase Order Date 4/28/2016

PO Print Date 4/28/2016

Page Number 2 of 3

Order From :
METAUX CASTLE
P.O. BOX 4090 STN A
TORONTO, ONTARIO M5W OE9
CANADA

VU-MET002

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone

Ship To Contact

Ship To Phone

Ship Via: Yours ppd

Ship Acct:

Buyer

Customer POID

Customer Tax #

Terms

Currency

FOB

Chantal Lavoie

10127-2607

Net 30

USD

Destination-Collect

Line Total: \$1,607.50

3	D6104-011P	17-4 SS Roundbar 6.50"Od	5/16/2016	10.00	\$115.00	\$1,150.00
			Yes	Each		
			5/16/2016			

AS PER DWG D6104 REV. B
B144958
MATERIAL: 17-4 PH SIZE: 6.50" X 4.100" LONG

Line Total: \$1,150.00

4	D6104-005P	17-4 SS Roundbar 4.00"Od	5/16/2016	20.00	\$54.20	\$1,084.00
			Yes	Each		
			5/16/2016			

AS PER DWG D6104 REV. B
B144957
MATERIAL: 17-4 PH AS PER AMS 4643 OR AISI 630
SIZE: 4.00" X 5.10" LONG

Line Total: \$1,084.00

Note:

4/28/2016



A. M. Castle & Co.

PACKING SLIP/
CERTIFICATE OF CONFORMANCE

Page 1 of 2

Shipment No:2963584

Ship From: A. M. CASTLE & CO. 2150 ARGENTIA ROAD MISSISSAUGA, ON L5N 2K7 CAN		Sold To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		Ship To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CAN		Deliver To: DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
Date Shipped 04-MAY-16	F.O.B. ORIGIN	Freight Terms Prepaid		Carrier MANITOULIN		BOL No 2963584-2	

Shipment Details	Final Destination Branch - TOR
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Order No 4345038	Line No 2	Item No 42464 MO	Description 4.0000.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 5.1 IN (+ .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643 ALL PAPERWORK MUST FOLLOW ORDER / CUSTOMER MUST RECEIVE AT TIME OF DELIVERY ALL MATERIAL MUST HAVE IDENTIFYING MARKINGS EX:HEAT #'S Email P/s and certs to: clavoie@dartaero.com
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Purchase Order No 32189	Part Number YOUR ITEM NUMBER: D6104-0051	Ordered Qty 20.00 PCS	Invoice Qty 20.00 PCS
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Details	USE HT # W5L9 ONLY ALL PAPERWORK MUST FOLLOW ORDER / CUSTOMER MUST RECEIVE AT TIME OF DELIVERY ALL MATERIAL MUST HAVE IDENTIFYING MARKINGS EX:HEAT #'S Email P/s and certs to: clavoie@dartaero.com END USER: DART AEROSPACE END USE: COMMERCIAL AIRCRAFT PARTS
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8/6-05-05

Delivery No.	Mill	Heat Number	Mech Id	PCS	Width (IN)	Length (IN)	Shipped Qty(LBS)
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Castle Metals®

A. M. Castle & Co.

PACKING SLIP/
CERTIFICATE OF CONFORMANCE

Page 2 of 2

120420005	NORTH AMERICAN STAINLESS			20			374.5814
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These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Chris Galt

Date:

Name:

MAY 04 2016



SP/6-05-05



**NORTH AMERICAN
STAINLESS**

METALLURGICAL TEST REPORT

6870 Highway 42 East
Ghent, KY 41045-9615
(502) 347-6000

Certificate: 105025 02	Mail To:	Ship To:	Date: 10/15/2015	Page: 1 of 1
	A.M. CASTLE AND COMPANY	A.M. CASTLE AND COMPANY	Steel: 630(17-4)	
	1420 KENSINGTON ROAD-SUITE 220	26800 MILES ROAD	Finish: Hot Finish	
	OAK BROOK IL 60523	BEDFORD HEIGHTS OH 44146	Dia/Thk: 4.0000 in	
Customer: 0032 005			Leg Length:	
NAS Order: LP 37916 1			Length: 144.00 in	
Your Order: 346085-1	Item Code: 42464		Corrosion:	

PRODUCT DESCRIPTION:

AMS 2303F,
Round Bar, Hot Rolled, Annealed, Rough Turned
UNS S17400; EN 10204 3.1, ASTM A484/11, MACRO OK, AMS 5643T
ASTM A564/13, AMS 2303, ASME SA564-07, ASTM F899/11(CHEM ONLY)
SOL. ANNEALED @ 1900F MIN FOR 1 HR MIN. and air cooled to RT
H900 MECH. PROPERTIES ARE CAPABILITY ONLY*

REMARKS:

COMPLIES W/REQUIREMENTS OF DFAR 252.225-7009 EU DIRECTIVE
2011/65/EU.ROHS. EAF+AOD+CC. NO WELD REPAIR. MELTED AND MFG
IN USA FREE FROM MERCURY AND LOW MELTING ALLOY CONTAMINATION

DAS
14
9.89

16/05/06

Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight
BH50373	2090	BH50382	2018						

Lab Accreditation Bureau, ISO/IEC 17025, Certificate# L2323

CHEMICAL ANALYSIS

CM(Country of Melt) ES(Spain) US(United States) ZA(South Africa) JP(Japan)

Chemical Analysis per ASTM A751/08

Heat	Supplier #	CM	C %	CB %	CO %	CR %	CU %	MN %	MO %	N %	NI %	P %
W5L9		US	.022	.176	.09	15.38	3.02	.77	.09	.027	4.21	.020
			S %	SI %	TA %	TI %						
			.0285	.62	.0080	.0020						

MECHANICAL PROPERTIES

	1 d	HB	Grain	Ferrite	TS-900CAP	YS-900CAP	El-900CAP	RA-900CAP	RC-900CAP	FREQ.	SEV.
	o i	No.	No.	%	KSI	KSI	% 4D	%	No.	No.	No.
BH50373	R L	341.0	8.0	.10	200.24	175.93	12.88	44.20	42.5	.20	.11
BH50382	R L	341.0	8.0	.10	200.24	175.93	12.88	44.20	42.5	.20	.11



NAS hereby certifies that the analysis on this certification is correct. Based upon the results and the accuracy of the test methods used, the material meets the specifications stated. These results relate only to the items tested and this report cannot be reproduced, except in its entirety, without the written approval of NAS

Technical
Dept. Mgr.

AB Bhawe

ABHIJEET BHAVE

MATERIAL RECEIPT INSPECTION FORM

MATERIAL D6104-005
DATE 11/05/06

PO / BATCH NO 32189/144957

MATERIAL CERT REC'D yes
QUANTITY RECEIVED 20
QUANTITY INSPECTED 20
QUANTITY REJECTED _____

THICKNESS ORDERED 04.00 X 5.100
THICKNESS RECEIVED 04.04 X 5.250
SHEET SIZE ORDERED _____
SHEET SIZE RECEIVED _____

DESCRIPTION	NCR (Check Y/N)		COMMENTS
SURFACE DAMAGE	☒	☒	
CORRECT FINISH	☒	☒	
CORROSION	☒	☒	
CORRECT GRAIN DIRECTION	☒	☒	
CORRECT MATERIAL	☒	☒	
CORRECT THICKNESS	☒	☒	
PHOTO REQUIRED	☒	☒	
CORRECT MATERIAL	☒	☒	
CORRECT REF # TO LINK CERT	☒	☒	
CORRECT MATERIAL IDENTIFICATION	☒	☒	
CORRECT M# ON THE MATERIAL	☒	☒	144957
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	☒	☒	
DOES THIS REQUIRE AN EXTRUSION REPORT	☒	☒	

CUT SAMPLE PIECE OF MATERIAL AND PREFORM A HARDNESS CHECK				
RECORD RESULTS BELOW				
TYPE OF MATERIAL SIZE OF TEST SAMPLE HARDNESS / DUROMETER READING	HRC	HRB	DUR A	DUR D

testers located in the Quality Office

QC 18 INSPECTION		ENGINEERING SIGNOFF (if required)	
INSPECTED BY <u>DAS</u>	SIGNED OFF BY _____		
DATE <u>11/05/06</u>	DATE _____		

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

MATERIAL RECEIPT INSPECTION FORM

INSTRUCTIONS FOR INSPECTING BAR, TUBING, ROUND, & SHEET STOCK

1. VERIFY STOCK TO DART PURCHASE ORDER
2. MEASURE ALL DIMENSIONS FOR EACH PURCHASED STOCK
 - a. WIDTH, THICKNESS, DIAMETER, WALL THICKNESS & LENGTH
3. VERIFY CONDITION OF MATERIAL i.e. DAMAGED, CORRODED, etc
4. VERIFY THAT SUPPLIER HAS A NUMBER (HEAT #) ON ITS RECEIVING REPORT TO LINK TO MATERIAL CERTS
5. VERIFY MATERIAL CERTS ARE CORRECT TO THE DART PO INSTRUCTIONS
6. REMOVE / CUT A PIECE OF MATERIAL FOR SAMPLE HARDNESS TESTING

INSTRUCTIONS FOR INSPECTING SKIDTUBE & STEP EXTRUSION

1. VERIFY TO DART SUPPLIED DRAWING
 2. SAMPLE INSPECT MATERIAL IN BUNDLE TO ENSURE MATERIAL CAN BE RECEIVED INTO DART
 3. USING PORTABLE HARDNESS TESTER VERIFY HARDNESS OF THE MATERIAL TO THE DRAWING
 4. VERIFY THAT MATERIAL CERTS MATCH TO WHATS CALLED UP ON THE DART DRAWING
- AFTER MATERIAL PASSES INSPECTION**
5. HAVE DART EMPLOYEES START STOCKING MATERIAL BUT REQUEST MIN 20pcs FOR FULL INSPECTION
 6. INSPECT ALL DIMS AS PER DRAWING REQUIREMENTS

INSTRUCTIONS FOR INSPECTING CROSS TUBE MATERIAL

1. VERIFY MATERIAL CERTS MATCH THE REQUIREMENTS ON THE DART DRAWINGS
2. INSPECT MIN HALF THE BATCH OF EXTRUSION RECEIVED INTO DART
3. INSPECT MATERIAL AS PER THE EXTRUSION REPORT
 - a. WALL THICKNESS USING ULTRA-SONIC IN 4 LOCATIONS
 - b. OUTSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - c. INSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - d. STRAIGHTNESS @ CENTER OVER 12" SPAN
 - e. WALL THICKNESS USING TUBE MICROMETER HIGHEST/LOWEST BOTH ENDS
4. IDENTIFY EACH TUBE IN SEQUENCE OF INSPECTING (TUBE 1, TUBE2) AND W/O# AND PO#
5. RECORD ALL FINDINGS ON EXTRUSION REPORT

IF ANY QUESTIONS PLEASE SEE QC COORDINATOR BEFORE GOING FURTHER